TROUBLESHOOTING AND SPARE PARTS MANUAL

SPRINT 555 CNC

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An error has occurred during setup or cycling of the bar feeder. When an error occurs, an alarm message is generated on the remote control station. Also provided are some possible causes as to why the error has occurred. This troubleshooting guide discusses every alarm that the bar feed may generate. In conjunction with each alarm will be a brief description of what the alarm is and a few tips and procedures of how to correct the problem.
### Descriptions of Hydromag Accessories

<table>
<thead>
<tr>
<th>Designation</th>
<th>Ordering no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.551 / 6.0, 7.0</td>
<td>Remote control station</td>
</tr>
<tr>
<td>B</td>
<td>(*)</td>
<td>Electrical cabinet</td>
</tr>
<tr>
<td>C</td>
<td>4.068/4.074</td>
<td>Optional interface cable outlet (not shown here)</td>
</tr>
<tr>
<td>M 1</td>
<td>2.230</td>
<td>Hydraulic pump motor</td>
</tr>
<tr>
<td>M 2</td>
<td>4.706</td>
<td>Servo motor</td>
</tr>
<tr>
<td>M 3</td>
<td>4.796</td>
<td>Magazine motor</td>
</tr>
<tr>
<td>M 5</td>
<td>4.798</td>
<td>Guiding elements locking motor</td>
</tr>
<tr>
<td>QS 1</td>
<td>4.242</td>
<td>Main disconnect switch</td>
</tr>
<tr>
<td>SP 1</td>
<td>3.329</td>
<td>Air pressure switch</td>
</tr>
<tr>
<td>SP 2</td>
<td>4.050</td>
<td>Hydraulic pressure switch</td>
</tr>
<tr>
<td>SQ 1</td>
<td>4.772</td>
<td>Positioning proximity switch (optical cell)</td>
</tr>
<tr>
<td>SQ 2</td>
<td>4.391</td>
<td>Guiding elements locked counting proximity switch</td>
</tr>
<tr>
<td>SQ 3</td>
<td>4.790</td>
<td>Guiding elements open</td>
</tr>
<tr>
<td>SQ 4</td>
<td>4.790</td>
<td>Guiding elements closed</td>
</tr>
<tr>
<td>SQ 5</td>
<td>4.391</td>
<td>Feed pusher in home position control</td>
</tr>
<tr>
<td>SQ 6</td>
<td>4.790</td>
<td>Bar stock laying fingers up position control</td>
</tr>
<tr>
<td>SQ 7</td>
<td>4.790</td>
<td>Bar stock laying fingers down position control</td>
</tr>
<tr>
<td>SQ 8</td>
<td>4.391</td>
<td>Bar stock magazine indexing</td>
</tr>
<tr>
<td>SQ 9</td>
<td>4.772</td>
<td>Bar stock presence proximity switch</td>
</tr>
<tr>
<td>SQ 10</td>
<td>4.484</td>
<td>Retraction system in position switch</td>
</tr>
<tr>
<td>SQ 11</td>
<td>4.484</td>
<td>Main access cover safety switch</td>
</tr>
<tr>
<td>SQ 12</td>
<td>4.772</td>
<td>Remnant check (option)</td>
</tr>
<tr>
<td>SQ 15</td>
<td>4.763</td>
<td>Magazine protection safety switch</td>
</tr>
<tr>
<td>SQ 16</td>
<td>4.773</td>
<td>Magazine safety switch (optical cell)</td>
</tr>
</tbody>
</table>
ALARM HISTORY

Description:

The Most Recent Alarms feature allows the user to view the 20 most recent alarms that have occurred on the bar feed. This is helpful when determining what to look at as far as troubleshooting problems that have recently taken place, especially when the troubleshooting involves contacting LNS America, Inc. for assistance and the message has already been cleared.

On certain lathes, once the bar feed sends an alarm to the machine, the machine will in return send an emergency stop alarm to the bar feed which overrides any bar feed alarms. Once the bar feed alarm is overridden the only way to pinpoint the original bar feed alarm is to enter into the alarm history.

This menu is located HELP menu, to locate the alarm history follow the steps below:

Step 1: Press the HELP key on the remote control station at any time.

Step 2: Press the PAGE DOWN key 6 times.

Use the PAGE UP and PAGE DOWN keys to scroll through alarms. The alarms are are listed with the most recent alarm being the first to appear to the 20th most recent alarm being listed last.
A001 - Emergency Line Open!

**POSSIBLE CAUSES:**
- CONNECTION
- PROBLEM IN CIRCUITRY

**A001**

---

**Description:**

The Emergency Stop Line Open alarm occurs whenever the PLC does not detect input (I2.0). The problem is generated anytime the safety circuit contactor (K1) is not energized and all safety switches are in operating position. (Refer to Chapter 4 in the *Hydrobar Sprint 555 Instruction Manual*).

**Solution:**

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) three times.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
</table>
| 1    | Bit 0 = 0 | MODULE 2 76543210 | • Verify that the 2/16 connector is plugged into the PLC correctly.  
• Verify that the circuitry is wired correctly to the electrical diagram in Chapter 4 of the *Hydrobar Sprint 555 Instruction Manual*. |
| 2    | Bit 0 = 1 | MODULE 2 76543210 | Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm. |

For case 1, after the solutions have been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A003 - Lathe Emergency Stop Line Open

LATHE EMERGENCY STOP LINE OPEN!

POSSIBLE CAUSES:
- EMERGENCY STOP PUSHED IN
- WIRING PROBLEM

Description:
The Lathe Emergency Stop Line Open alarm occurs whenever the PLC does not detect input (I2.3). The problem is generated when the lathe E-stop push button is pressed in.

Solution:
Press the HELP key on the remote control station. Press the F4 (Page Down icon) three times.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 3 = 1</td>
<td>MODULE 2 76543210 1000</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 3 = 0</td>
<td>MODULE 2 76543210 0</td>
<td>Reset the E-stop push button on the lathe.</td>
</tr>
</tbody>
</table>

For case 2, after the solutions have been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A004 - Bar Feeder Emergency Stop

BAR FEEDER
EMERGENCY STOP!

POSSIBLE CAUSES:
- EMERGENCY STOP
  BUTTON PUSHED IN
- WIRING PROBLEM

Description:
The Bar Feeder Emergency Stop alarm occurs whenever the PLC does not detect input (I2.2). The problem is generated E-stop push button on the remote control station is pressed in.

Solution:
Press the HELP key on the remote control station. Press the F4 (Page Down icon) three times.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 2 = 1</td>
<td>MODULE 2 76543210 100</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 2 = 0</td>
<td>MODULE 2 76543210 0</td>
<td>Reset the E-stop push button on the remote control station.</td>
</tr>
</tbody>
</table>

For case 2, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
Chapter 1: Alarms

A005 - Oil Pressure Failure

**OIL PRESSURE FAILURE!**

**POSSIBLE CAUSES:**

- PRESSURE SWITCH SP2 DEFECTIVE OR MIS-ADJUSTED
- PUMP FAILURE
- TANK EMPTY

**Description:**

The Oil Pressure Failure alarm occurs whenever the PLC does not detect input (I0.2 – SP2) while the hydraulic pump is running. The problem is generated after 30 seconds when oil pressure is not sufficient, below the factory setting of point of release of 0.5 bars, to activate the oil pressure switch. The bar feed does not alarm out until the chuck is open.

**Solution:**

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 2 = 1</td>
<td>MODULE 0 76543210 100</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 2 = 0</td>
<td>MODULE 0 76543210 0</td>
<td>Check the oil level indicator on the side of the hydraulic tank and make sure there is sufficient oil. Recommended 80 liters of ISO 100 type oil. Replace the oil pressure switch.</td>
</tr>
</tbody>
</table>

For case 2, after the solutions have been completed, Press the STOP key on the remote control station to clear the message and reset the alarm.
A006 - Air Pressure Failure

**Description:**

The Air Pressure Failure alarm occurs whenever the PLC does not detect input (I0.1 – SP1) after a period of 5 seconds. The problem is generated anytime air pressure is not sufficient, below 45psi, to make the air pressure switch.

**Solution:**

Press the HELP key on the remote control station. Press the F4 (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 1 = 1</td>
<td>MODULE 0 76543210 10</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 1 = 0</td>
<td>MODULE 0 76543210 0</td>
<td>Raise the incoming air pressure on the air regulator to (recommended) 75 psi. and no higher than 90 psi.</td>
</tr>
</tbody>
</table>

For case 2, after the solutions have been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A007 - Main Access Cover Open

**Description:**

The Main Access Cover Open alarm occurs whenever the PLC detects input (I0.0 – SQ11). The problem is generated, as a safety precaution, when the main access cover is opened to prevent any movement in the bar feeder if the operator or service technician needs to perform any work inside the unit.

**Solution:**

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 0 = 1</td>
<td>MODULE 0 76543210 1</td>
<td>Close the main access cover.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 0 = 0</td>
<td>MODULE 0 76543210 0</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>

For case 1, after the solutions have been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A009 - Bar Feeder Retracted

BAR FEEDER RETRACTED OR NOT LOCKED IN ITS WORKING POSITION!

SIGNAL SQ10 MISSING

SECURE BAR FEEDER IN ITS WORKING POSITION TO RESUME OPERATIONS  A009

Description:

The Bar Feeder Retracted alarm occurs whenever the PLC detects input (I2.1 – SQ10). The problem is generated when the bar feeder is retracted for spindle liner changeover.

Solution:

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) three times.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 1 = 1</td>
<td>MODULE 2 76543210 10</td>
<td>Put the bar feeder back in its working position and lock it in place.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 1 = 0</td>
<td>MODULE 2 76543210 0</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>

For case 1, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
**A011 - Magazine Protection Grid Open**

**Description:**

The Magazine Protection Grid Open alarm occurs whenever the PLC detects input (I2.6 – SQ15). The problem is generated, as a safety precaution, when the magazine protection grid is opened, to prevent any movement in the bar feeder if the operator or service technician needs to perform any work inside the unit.

**Solution:**

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) three times.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 6 = 1</td>
<td>MODULE 2 76543210 1000000</td>
<td>Close the magazine protection grid.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 6 = 0</td>
<td>MODULE 2 76543210 0</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>

For case 1, after the solutions have been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A012 - Bar Magazine Indexing Interrupted!

Description:

The Bar Magazine Indexing Interrupted alarm occurs whenever the PLC does not detect input (I2.7 – SQ16) while the chain rack is loading a new bar into the channels. The problem is generated, as a safety precaution, when the reflective sensor is blocked, to prevent the chain fingers from pinching anything in between the magazine protection grid.

Solution:

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 7 = 1</td>
<td>MODULE 0 76543210 10000000</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 7 = 0</td>
<td>MODULE 0 76543210 0</td>
<td>Check to make sure there is nothing obstructing the beam reflector. Check the cleanliness of the reflector plate. Check the alignment of the reflector switch.</td>
</tr>
</tbody>
</table>

For case 2, after the solutions have been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
Chapter 1: Alarms

A022 - Servo Amp/PLC Comm. Fault

**Servo Amplifier/PLC Communication Fault**

- Turn off main power
- Wait for 2 seconds
- Restore main power

If problem persists refer to instruction manual A022

**Description:**

The Servo Amplifier/PLC Communication Fault alarm occurs when the PLC sends a message to the servo amplifier and the message is not confirmed by the servo amplifier via a checksum or vice versa. This is generated if one of three conditions is not met:

1. The data sent did not match the data received.
2. After 10 seconds, no response from the Servo Amplifier.
3. On power up, the amplifier and PLC parameters do not match.

**Solution:**

- Verify that the CN3 connector is connected properly on the servo amplifier as well as on the PLC.
- Verify the 24VDC supply for the PLC. Any voltage fluctuation can result in poor performance of the PLC.

If the problem persists please contact LNS America, Inc. for further information.
A023 - Servo Drive Alarm

SERVO DRIVE ALARM!

- TURN OFF MAIN POWER
- WAIT FOR 2 SECONDS
- RESTORE MAIN POWER

IF PROBLEM PERSISTS
REFER TO INSTRUCTION MANUAL

A023

Description:
The Servo Drive Alarm occurs if the Mitsubishi® servo amplifier generates an alarm.

Solution:
Turn the main power off to the Hydrobar Sprint 555 for 2 seconds and turn the power back on.

Note: If the alarm keeps recurring, check the alarm code on the Mitsubishi® servo amplifier and refer to Mitsubishi® Servo Amplifier Alarm List pg. 1-44.
A024 - Servo Motor Not Ready

Description:
The PLC outputs a signal (Q4.4) to servo amplifier, which engages the servo motor and puts the servo motor in a “servo lock” condition. If the servo amplifier does not recognize the signal after 3 seconds, this alarm is generated.

Solution:
- Verify that the CN1B connector is seated properly in the allotted socket on the servo amplifier.
- Verify that the PLC output (Q4.4) is turning on when the manual or automatic cycle is started.
- Verify that the K1 contactor is activated; input (I2.0) should be on.

If the problem persists please contact LNS America, Inc. for further information.
A025 - Servo Motor Positioning Error

SERVO MOTOR POSITIONING FOLLOWING ERROR!
DURING SEQUENCE NUMBER [@@]

POSSIBLE CAUSE:
MECHANICAL OBSTACLE PREVENTS BAR STOCK TO FEED OUT

A025

Description:
The Servo Motor Following Error alarm occurs due to a mechanical obstacle preventing the bar stock from feeding out. The torque on the servo motor will build up when the obstacle prohibits the stock from moving, once the torque reaches a certain limit the PLC instructs the servo amplifier to quit pushing and this alarm message appears on the remote control station.

Solution:

<table>
<thead>
<tr>
<th>Seq. #</th>
<th>Solution</th>
</tr>
</thead>
</table>
| ##     | Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.  
  - Check for any mechanical obstacles that the bar stock may be hitting. Remove obstacle if this is the case.  
  - Check the bar stock diameter. Make sure that the actual diameter is the same as the value entered in for the corresponding parameter in the Part Setup menu.  
  - Check the alignment between the bar feeder and the lathe. The lathe or the bar feeder may have shifted over a long period if either is not lagged to the floor securely. |

If the problem persists please contact LNS America, Inc. for further information.
A026 - Servo Amplifier Battery is Too Low

SERVO AMPLIFIER
BATTERY IS
TOO LOW!

-REPLACE THE BATTERY

**Description:**

The Servo Amplifier Battery is too Low alarm occurs if the voltage of the battery drops below the rated power that the absolute encoder inside the servo motor requires.

**Solution:**

Replace the battery inside the Servo amplifier (refer to the procedure in Chapter 4 of the *Hydrobar Sprint 555 Instruction Manual*). Then, press the STOP key on the remote control station to clear the message and reset the alarm.
A028 - Servo Amplifier Firmware Not Compatible with PLC

Description:

The Servo Amplifier Firmware not Compatible with PLC alarm occurs during power up if the PLC does not recognize the firmware in the amplifier.

Solution:

Please contact LNS America, Inc. if this error occurs.
A041 – Bar Feeder in Simulation Cycle

ATTENTION!

BAR FEEDER IN SIMULATION CYCLE!
BAR STOCK IS PRESENT IN THE BAR FEEDER.
OPERATION ERROR!
EXIT SIMULATION MODE

A041

Description:

The Bar Feeder in Simulation Cycle alarm occurs when the bar feed detects a bar in the guiding channel while operating in simulation mode.

Solution:

Exit the simulation operation if production is to be run, or remove the material from the guiding channel and any material on the chain magazine rack before restarting the simulation cycle.
**A042 - Home Position Proximity Switch SQ7 Signal Missing**

**Description:**

The Home Position Proximity Switch SQ7 Signal Missing alarm occurs if input (I1.1 – SQ5) is not detected by the PLC during the remnant extraction sequence or re-referencing.

**Solution:**

Press the STOP key on the remote control station to clear the message and reset the alarm. Press the HELP key. Press F4 (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 1 = 1</td>
<td>MODULE 1 76543210</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 1 = 0</td>
<td>MODULE 1 76543210</td>
<td>Check to see if there is a mechanical obstruction preventing the carrier flag from reaching the home position. Make sure that the SQ5 switch is adjusted to within a sensing distance of 0.5mm-1mm from the measuring stop. Check the belt tension. If the input still does not turn on, the problem can be isolated to a defective switch or defective cable. Replace the cable and switch.</td>
</tr>
</tbody>
</table>

For case 2, after the solutions have been completed, press the STOP key on the remote control station to clear the message and reset the alarm. In any case, the bar feed will require the re-referencing of the home position. Refer to pg. 3-4 for the Reference Procedure.
Chapter 1: Alarms

A043 - Pusher Lost the Bar Stock During its Return to Home Position

PUSHER LOST THE
BARSTOCK DURING ITS
RETURN TO HOME
POSITION!

POSSIBLE CAUSES:
- WRONG SIZE OR
  DEFECTIVE COLLET
- EXCESSIVE BURRS
- MECHANICAL FAILURE

Description:
The Pusher Lost The Barstock During Its Return To Home Position alarm occurs during the remnant extraction sequence when the measuring cell does not detect a remnant inside the collet while the pusher reverses. During the remnant extraction sequence, the measuring cell calculates how much material has passed while the pusher is reversing. If the calculation is equal to (pusher length + 0), the bar feed has determined that the remnant has not been brought back and this alarm is generated.

Solution:
Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.

- Check that the collet is the correct size for the stock being run and also that the collet is not cracked or broken.
- Check the bar stock for any excessive burrs that may have prevented the bar from properly inserting into the collet. It is recommended that the back of the bar stock be chamfered before loading it onto the magazine.
- Contact LNS America, Inc. for further information.
A044 - Bar Loading Error

BAR LOADING ERROR!
HEX, SQUARE BARS

POSSIBLE CAUSES:
- LOADING SAFETY TIME ELAPSED
- BAR STOCK NOT FED THROUGH THE COLLET OF THE LATHE

A044

Description:
The Bar Loading Error alarm occurs during the top-cut positioning sequence when loading profiled material. During the loading cycle, when profiled material has been selected, the bar stock is brought to the back of the clamping device. When this position is reached, the spindle is jogged at a very low rpm and the pusher begins a pecking motion until the profile of the material and the profile of the clamping device are aligned and the bar is fed out to the top-cut position. If the top-cut position is not reached after 20 pecking cycles, this alarm is generated.

Solution:
Alarm needs to be cleared. Press the STOP button on the remote control station to clear and reset the alarm. Remove the bar from the spindle and restart the top-cut positioning cycle.

If the problem persists please contact LNS America, Inc. for further information.
Chapter 1: Alarms

A046 - Chuck Closed Prior to Feed Out Complete

**Description:**

The Clamping Device Has Closed Prior To Completing The Feed Out alarm occurs if the input for the clamping device closed is detected before the value of the *Input Overall Part Length* parameter is reached.

**Solution:**

- Verify that the clamping device is closing properly and that the *Clamping Signal Active* interface parameter is set in conjunction with how the interface signal is being sent.
- Verify that the correct part length has been entered in the PARAMETERS RELATED TO APPLICATIONS menu.
**A047 - A2 Interrupted During Loading**

SIGNAL A2 (LATHE IN AUTOMATIC MODE) INTERRUPTED DURING LOADING CYCLE!

RESUME AUTOMATIC CYCLE OF THE LATHE AND THE BAR FEEDER.

---

**Description:**

The Signal A2 Interrupted During Loading Cycle alarm occurs whenever PLC input (I3.1) drops out during the loading cycle.

**Solution:**

Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm. Remove the bar stock from the loading channel and reset the bar feeder and the lathe in automatic cycle.
A048 - Safety Time for Part Feed Out

SAFETY TIME FOR PART FEED OUT ELAPSED!

POSSIBLE CAUSES:
- PROGRAMMING ERROR
- MECH. INTERFERENCE
- INTERFACE PROBLEM

Description:
The Safety Time For Part Feed Out Elapsed alarm occurs if the value set in INPUT OVERALL PART LENGTH is not reached within 1 minute after the bar feed is commanded to feed out.

Solution:
Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.

- Make sure that value for the INPUT OVERALL PART LENGTH is correct.
- Check for any mechanical obstruction that will not allow the bar feed to reach the feed out distance.

Contact LNS America, Inc. for further information.
A053 - Lathe Did Not Resume Its Production Cycle

Description:

The Safety Time For Part Feed Out Elapsed alarm occurs if the value set in INPUT OVERALL PART LENGTH is not reached within 1 minute after the bar feed is commanded to feed out.

Solution:

Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.

- Make sure that value for the INPUT OVERALL PART LENGTH is correct.
- Check for any mechanical obstruction that will not allow the bar feed to reach the feed out distance.

Contact LNS America, Inc. for further information.
**A054 - Bar Remnant Too Long**

**BAR REMNANT TOO LONG!**

**POSSIBLE CAUSES:**
- END OF BAR POSITION IMPROPERLY ADJUSTED
- MACHINING VERY LONG PARTS WITHOUT OPTIMIZING BAR LENGTH FOR MINIMUM REMNANT LENGTH A054

**Description:**

The maximum remnant that the bar feed can remove is 400mm (15.748”). The Bar Remnant Too Long alarm occurs during the remnant extraction sequence. After machining the last part and the clamping device opens, the pusher reverses and the measuring cell SQ1 calculates the length of the remnant. If the remnant exceeds the length mentioned above it cannot fit through the remnant chute and will have to be removed manually and this alarm is generated.

**Solution:**

1. Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.
2. Press the F1 key on the remote control station for manual mode.
3. Press the F1 key on the remote control station and remove the long remnant from the channel.
4. After removing the remnant from the channel, press the F1 key (✓) to verify that the bar has been manually removed from the channel.
   - Check the End of Bar setting in the Parameters Related to Positioning menu.
   - If the part length is fairly long, it will be necessary to cut the bar stock to achieve a minimum remnant length.
   - If the problem persists please contact LNS America, Inc. for further information.
A055 - Guiding Channel Malfunction During Closing

**GUIDING CHANNEL MALFUNCTION DURING CLOSING!**

**POSSIBLE CAUSES:**
- CLOSING MECHANISM MALFUNCTION
- SIGNAL SWITCH SQ3 DEFECTIVE OR MIS-ADJUSTED

**Description:**

The Guiding Channel Malfunction During Closing alarm occurs if input (I0.5 – SQ3) does not turn during the channel closing sequence.

**Solution:**

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
</table>
| 1    | Bit 5 = 1 | MODULE 0 76543210 100000 | - Check to see if a mechanical obstruction is preventing the channel from closing.  
- Check the functionality of the SQ3 switch. The switch may be sticking and needs to be replaced. |
| 2    | Bit 5 = 0 | MODULE 0 76543210 0 | Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm. |

For case 1, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A056 - Guiding Channel Malfunction During Opening

GUIDING CHANNEL MALFUNCTION DURING OPENING!

POSSIBLE CAUSES:
- OPENING MECHANISM MALFUNCTION
- SIGNAL SWITCH SQ3 DEFECTIVE OR MIS-ADJUSTED

Description:
The Guiding Channel Malfunction During Opening alarm occurs if input (I0.5 – SQ3) does not turn on when the channel opens up.

Solution:
Press the HELP key on the remote control station. Press the F4 key (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 5 = 1</td>
<td>76543210100000</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>
| 2    | Bit 5 = 0 | 765432100 | - Check to see if a mechanical obstacle prevents the channel from opening.  
- Check the channel opening/closing cylinder functionality.  
- Check the adjustment and functionality of the SQ3 switch. |

For case 2, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A057 - Default Prior to Opening the Guiding Channel

**DEFAULT PRIOR TO OPENING THE GUIDING CHANNEL!**

POSSIBLE CAUSES:
- SIGNAL SWITCH SQ3 DEFECTIVE OR MIS-ADJUSTED
- MECHANICAL FAILURE

A057

**Description:**

The Default Prior To Opening The Guiding Channel alarm occurs if the channel is closed and input (I0.5 – SQ3) is on before the guiding channel tries to open.

**Solution:**

Press the HELP key on the remote control station. Press the F4 key (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 5 = 1</td>
<td>MODULE 0 76543210 100000</td>
<td>The switch may be sticking and needs to be replaced.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 5 = 0</td>
<td>MODULE 0 76543210 0</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>

For case 1, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A058 - Guiding Channel Malfunction During Closing

**GUIDING CHANNEL MALFUNCTION DURING CLOSING!**

**POSSIBLE CAUSES:**
- CLOSING MECHANISM MALFUNCTION
- SIGNAL SWITCH SQ4 DEFECTIVE OR MIS-ADJUSTED

**Description:**
The Guiding Channel Malfunction During Closing alarm occurs if input (I0.6 – SQ4) does not turn on when the channel closes.

**Solution:**

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 6 = 1</td>
<td>MODULE 1 76543210 1000000</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>
| 2    | Bit 6 = 0 | MODULE 1 76543210 0 | ▪ Check to see if a mechanical obstacle prevents the channel from opening.  
  ▪ Check the channel opening/closing cylinder functionality.  
  ▪ Check the adjustment and functionality of the SQ4 switch. |

For case 2, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A059 - Guiding Channel Malfunction During Opening

GUIDING CHANNEL MALFUNCTION DURING OPENING!

POSSIBLE CAUSES:
- OPENING MECHANISM MALFUNCTION
- SIGNAL SWITCH SQ4 DEFECTIVE OR MIS-ADJUSTED

Description:
The Guiding Channel Malfunction During Opening alarm occurs if input (I0.6 – SQ4) does not turn off after the channel opens.

Solution:
Press the HELP key. Press F4 (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 6 = 1</td>
<td>MODULE 1 76543210 1000000</td>
<td>• The switch may be sticking and needs to be replaced.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 6 = 0</td>
<td>MODULE 1 76543210 0</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>

For case 1, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
Chapter 1: Alarms

A060 - Default Prior to Closing the Guiding Channel

DEFAULT PRIOR TO CLOSING THE GUIDING CHANNEL!

POSSIBLE CAUSES:
- SIGNAL SWITCH SQ4
  DEFECTIVE OR
  MIS-ADJUSTED

Description:
The Default Prior To Closing The Guiding Channel alarm occurs if input (I0.6 – SQ4) is already on before the channel before the channel tries to close.

Solution:

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bit 6 = 1</td>
<td>MODULE 1 76543210 1000000</td>
<td>• The switch may be sticking and needs to be replaced.</td>
</tr>
<tr>
<td>2</td>
<td>Bit 6 = 0</td>
<td>MODULE 1 76543210 0</td>
<td>Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.</td>
</tr>
</tbody>
</table>

For case 1, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
Bar Stock Not Extracted from the Collet

**BAR STOCK NOT EXTRACTED FROM THE COLLET!**

**POSSIBLE CAUSES:**
- EXTRACTION DEVICE MALFUNCTION
- SIGNAL SWITCH SQ5 DEFECTIVE OR MIS-ADJUSTED
- MECHANICAL FAILURE

**Description:**

The Bar Stock Not Extracted From The Collet alarm occurs when input (I1.5 – SQ12) is not detected after the bar has been extracted from the collet of the bar feed. Before the guiding channel opens to load a new bar, the remnant check device confirms that the remnant has been extracted from the collet of the bar feed.

**Solution:**

- Check that the extraction device jaws are not broken.
- Check the adjustment of SQ12, the switch should only activate when no bar is present in the collet of the bar feed.
- Contact LNS America Inc. for further information.
A068 - Bar Stock Moving Forward during Headstock Reverse with Collet Open

**Description:**

The Bar Stock Moving Forward alarm is generated when the bar feed detects any forward movement by the feeding pusher while the collet of the lathe is open and the headstock reverses for regrip.

**Solution:**

Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.

- Check that the cut-off tool is still intact. If it is broken, it will need to be replaced before putting the bar feed back in automatic production. If this alarm occurs often due to cut-off tools breaking, reduce the pushing torque in the menu **Parameters Related to Servo Drive (Torques)**.

If the problem persists please contact LNS America, Inc. for further information.
**A070 - Bar Stock Insertion Malfunction**

**BAR STOCK INSERTION MALFUNCTION!**

**POSSIBLE CAUSES:**
- WRONG SIZE COLLET
- BURRS ON BAR STOCK
- MECHANICAL PROBLEM

**Description:**

The Bar Stock Insertion Malfunction alarm occurs during the loading sequence when the bar is not properly inserted into the collet of the feeding pusher. The bar feed will try multiple times to insert the bar, after a period of time and the bar still hasn’t inserted correctly this alarm is generated.

**Solution:**

Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.

- Make sure that the collet is the correct size for the bar stock being ran.
- Check that there are no burrs on the back of the bar stock. LNS recommends that a chamfer be put on the back end of the bar.
- Check that all the proper parts are assembled for the pusher. Refer to the Guiding Channel Reference Chart in the Hydrobar Sprint 555 Instruction Manual.

If the problem persists please contact LNS America, Inc. for further information.
A115 - Bar Stock Moving Backwards during Headstock Reverse with Collet Open

Description:

The Bar Stock Moving Backwards alarm occurs when the bar feed detects any backward movement of the feeding pusher while the collet of the lathe is open and the headstock reverses for regrip.

Solution:

- Check that the collet of the lathe is opening to its maximum allowance.
- Check the pushing torque value in the menu Parameters Related to Servo Drive (Torques) on the bar feed. The value can be increased if necessary.
A116 - Bar Stock Loading Error

**Description:**

The Bar Stock Loading Error alarm occurs during the loading of a new bar sequence. The chain magazine rack will index 12 times, if input signal (I2.5 – SQ9) does not detect a bar this alarm is generated.

**Solution:**

Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm. Load up the magazine with material and restart the bar feed and lathe in automatic production.
**A124 - Pusher Length Error**

PUSHER LENGTH ERROR!

ADJUST TO PROPER PUSHER LENGTH

A124

**Description:**

The Pusher Length Error alarm occurs during the setup changeover sequence if the measurement taken of the new pusher does not correspond to a predetermined (in the software) length. This is generally due to the incorrect assembly of the pushing rod.

**Solution:**

- Verify the assembly of the pusher to the Guiding Channel Reference Chart in the *Hydrobar Sprint 555 Instruction Manual*. Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm.
**A126 - Bar Magazine Motor M3 Faulty**

**Description:**

The Bar Magazine Motor M3 Faulty alarm occurs if, during the loading cycle, the output for the M3 motor is active and input signal (I2.4 – SQ8) does not change states (pulse on/off) after several seconds.

**Solution:**

- Make sure that the SQ8 switch is adjusted to within a sensing distance of 0.5mm-1mm from the chain fingers.
- Check the functionality of the SQ8 switch. Should pulse on/off as the chain is indexing.
- Check to see if there is a mechanical obstruction preventing the chain rack from indexing.
**A127 - Problem During Dropping Fingers Rising**

**Description:**

The Problem During Dropping Fingers Rising alarm occurs during the loading cycle, while the bar dropping fingers are in the up position and input signal (I1.1 – SQ7) does not turn on or if input signal (I1.0 – SQ6) does not turn off.

**Solution:**

Press the HELP key. Press F4 (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
</table>
| 1    | Bit 0 = 1  
Bit 1 = 0 | MODULE 1  
76543210  
1 | ▪ Check for a mechanical obstruction which may be keeping the dropping fingers from rising.  
▪ Check for a pinched air line going to the lifting cylinder. |
| 2    | Bit 0 = 0  
Bit 1 = 1 | MODULE 1  
76543210  
10 | Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm. |
| 3    | Bit 0 = 1  
Bit 1 = 1 | MODULE 1  
76543210  
11 | ▪ Check the adjustment of switch SQ6. |
| 4    | Bit 0 = 0  
Bit 1 = 0 | MODULE 1  
76543210  
0 | ▪ Check the adjustment of switch SQ7.  
▪ Check for a mechanical obstruction which may be keeping the dropping fingers from completing its full stroke.  
▪ Check for a pinched air line going to the lifting cylinder. |

For case 2, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
A128 - Problem During Dropping Fingers Descent

**Description:**

The Problem During Dropping Fingers Rising alarm occurs during the loading cycle, while the bar dropping fingers are in the up position and input signal (I1.0 – SQ6) does not turn on or if input signal (I1.1 – SQ7) does not turn off.

**Solution:**

Press the HELP key. Press F4 (Page Down icon) twice.

<table>
<thead>
<tr>
<th>Case</th>
<th>Input</th>
<th>Remote Pendant</th>
<th>Solution</th>
</tr>
</thead>
</table>
| 1    | Bit 0 = 1  
      Bit 1 = 0  | MODULE 1  
               765432101 | Alarm needs to be cleared. Press the STOP key on the remote control station to clear the message and reset the alarm. |
| 2    | Bit 0 = 0  
      Bit 1 = 1  | MODULE 1  
               7654321010 | ▪ Check for a mechanical obstruction which may be keeping the dropping fingers from lowering. |
| 3    | Bit 0 = 1  
      Bit 1 = 1  | MODULE 1  
               7654321011 | ▪ Check the adjustment of switch SQ7. |
| 4    | Bit 0 = 0  
      Bit 1 = 0  | MODULE 1  
               7654321010 | ▪ Check the adjustment of switch SQ6.  
▪ Check for a mechanical obstruction which may be keeping the dropping fingers from lowering. |

For case 1, after the solution has been completed, press the STOP key on the remote control station to clear the message and reset the alarm.
<table>
<thead>
<tr>
<th>Sequence Number</th>
<th>Sequence Event</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reference origin - first power up / controller replaced / software updated</td>
<td>If guiding channel closed&gt;&gt;Seq. 14 Else&gt;&gt;Seq. 2</td>
</tr>
<tr>
<td>2</td>
<td>Reference procedure- carrier flag at home position; guiding channel open</td>
<td>SQ5 on</td>
</tr>
<tr>
<td>3</td>
<td>SQ1 optical cell control</td>
<td>SQ1 off</td>
</tr>
<tr>
<td>4</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>Carrier flag forward in front of pusher position; bar measuring with SQ1</td>
<td>Measure bar length</td>
</tr>
<tr>
<td>6</td>
<td>Vise jaws close; Carrier flag reverse to home position</td>
<td>(if remnant extraction device selected: SQ12 on); SQ5 on + Axis 0; SQ4 off</td>
</tr>
<tr>
<td>7</td>
<td>Guiding elements closing control with SQ3 switch</td>
<td>Before seq. 7: SQ4 off After seq. 7: SQ3 off</td>
</tr>
<tr>
<td>8</td>
<td>Guiding elements closing control with SQ4 switch</td>
<td>SQ4 on: time 200ms</td>
</tr>
<tr>
<td>9</td>
<td>Pusher forward for bar stock insertion</td>
<td>If remnant extraction device selected&gt;&gt; (insertion feed rate); Else&gt;&gt;Seq. 10</td>
</tr>
<tr>
<td>10</td>
<td>Bar measuring if not already done in seq. 5</td>
<td>SQ1 on: stop OK</td>
</tr>
<tr>
<td>11</td>
<td>Push forward behind clamping device</td>
<td>If profiled material is selected: parameter Loading Of Else&gt;&gt;Seq. 12</td>
</tr>
<tr>
<td>12</td>
<td>Push forward to top-cut position</td>
<td>N/A</td>
</tr>
<tr>
<td>13</td>
<td>Bar stock at top-cut position</td>
<td>Wait for clamping device closed signal</td>
</tr>
<tr>
<td>14</td>
<td>Production cycle</td>
<td>Feed out OK</td>
</tr>
<tr>
<td>15</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>16</td>
<td>Pusher reverse to remnant extraction position</td>
<td>Guiding channel unlocked (if remnant extraction selected: SQ1 remnant measured)</td>
</tr>
<tr>
<td>17</td>
<td>Material presence control in automatic cycle</td>
<td>SQ12 on: time 200ms</td>
</tr>
<tr>
<td>18</td>
<td>Vise jaws close; pusher reverses to home (extracting remnant)</td>
<td>SQ5 on; SQ4 on</td>
</tr>
<tr>
<td>19</td>
<td>Remnant extraction control with SQ12 switch</td>
<td>SQ12 off</td>
</tr>
<tr>
<td>20</td>
<td>Guiding elements opening and material absence control</td>
<td>Before seq. 20: SQ3 off After seq. 20: SQ4 off</td>
</tr>
<tr>
<td>21</td>
<td>Guiding elements opening control with SQ3 switch</td>
<td>SQ3 on</td>
</tr>
<tr>
<td>22</td>
<td>Chain magazine rack index</td>
<td>N/A</td>
</tr>
<tr>
<td>23</td>
<td>Pusher changeover procedure (pusher forward to pusher change position)</td>
<td>N/A</td>
</tr>
<tr>
<td>24</td>
<td>Pusher changeover procedure (guiding channel opens)</td>
<td>SQ3 on; SQ4 off</td>
</tr>
<tr>
<td>25</td>
<td>Pusher changeover procedure (pusher forward for measuring)</td>
<td>SQ1- measure pusher length</td>
</tr>
<tr>
<td>26</td>
<td>Pusher reverse to pusher change position; guiding elements close</td>
<td>SQ3 off; SQ4 on</td>
</tr>
</tbody>
</table>
# Mitsubishi® Servo Amplifier Alarm List

## Position control mode

### (1) Troubleshooting

<table>
<thead>
<tr>
<th>No.</th>
<th>Start-up sequence</th>
<th>Fault</th>
<th>Investigation</th>
<th>Possible cause</th>
<th>Reference</th>
</tr>
</thead>
</table>
| 1   | Power on          | • LED is not lit.  
• LED flickers. | Not improved if connectors CN1A, CN1B, CN2 and CN3 are disconnected. | 1. Power supply voltage fault  
2. Servo amplifier is faulty. | Section 6.6 of the Mitsubishi® Servo Amplifier manual |
|     |                   |       | Improved when connectors CN1A and CN1B are disconnected. | Power supply of CNP1 cabling is shorted. |           |
|     |                   |       | Improved when connector CN2 is disconnected. | 1. Power supply of encoder cabling is shorted.  
2. Encoder is faulty. |           |
|     |                   |       | Improved when connector CN3 is disconnected. | Power supply of CN3 cabling is shorted. |           |
| 2   | Switch on servo-on signal. | Alarm occurs. | Refer to Section Alarm and warning list and remove cause. | Refer to Section Alarm and warning list and remove cause. | Section 11.2 |
| 3   | Gain adjustment   | Rotation ripples (speed fluctuations) are large at low speed. | Make gain adjustment in the following procedure:  
1. Increase the auto tuning response level.  
2. Repeat acceleration and deceleration several times to complete auto tuning. | Gain adjustment fault | Chapter 7 of the Mitsubishi® Servo Amplifier manual |
| 4   | Cyclic operation  | Position shift occurs | Confirm the cumulative command pulses, cumulative feedback pulses and actual servo motor position. | Pulse counting error, etc. due to noise. |           |

### CAUTION
- Excessive adjustment or change of parameter setting must not be made as it will make operation instable.

### POINT
- Using the optional servo configuration software, you can refer to unrotated servo motor reasons, etc.

The following faults may occur at start-up. If any of such faults occurs, take the corresponding action.

- LED is not lit.
- LED flickers.
- Rotation ripples (speed fluctuations) are large at low speed.
- Large load inertia moment causes the servo motor shaft to oscillate side to side.
Chapter 1: Alarms

When alarm or warning has occurred

POINT
- Configure up a circuit that will detect the trouble (ALM) signal and turn off the servo-on (SON) signal at occurrence of an alarm.

Alarms and warning list

When a fault occurs during operation, the corresponding alarm or warning is displayed. If any alarm or warning has occurred, refer to Section Alarm definitions and causes and take the appropriate action. Set "1" in parameter No. 59 to output the alarm code in ON/OFF status across the corresponding pin and SG. Warnings (AL.90 to AL.E9) have no alarm codes. Any alarm code is output at occurrence of the corresponding alarm. In the normal status, the signals available before alarm code setting (CN1B-19, CN1A-18, and CN1A-19) are output.

The alarms marked ○ in the alarm deactivation column can be deactivated by the corresponding operations.

<table>
<thead>
<tr>
<th>Display</th>
<th>(Note 2) Alarm code</th>
<th>Name</th>
<th>Alarm deactivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CN1B-19 pin</td>
<td>CN1A-18 pin</td>
<td>CN1A-19 pin</td>
</tr>
<tr>
<td>AL.10</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AL.12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.13</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.16</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.17</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.19</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.1A</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AL.20</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AL.24</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.25</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AL.30</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AL.31</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AL.32</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.33</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AL.35</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AL.37</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.45</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>AL.46</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>AL.50</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>AL.51</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>AL.52</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AL.8A</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.8E</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8888888</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AL.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL.92</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AL.96</td>
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<td></td>
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<tr>
<td>AL.98</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AL.9F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL.E0</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AL.E1</td>
<td></td>
<td></td>
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<td>AL.E3</td>
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<td>AL.E6</td>
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</tr>
<tr>
<td>AL.E9</td>
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</tr>
</tbody>
</table>

Removing the cause of occurrence deactivates the alarm automatically.

Note:
1. Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.
2. 0: Pin-SG off (open)
   1: Pin-SG on (short)
• When any alarm has occurred, eliminate its cause, ensure safety, then reset the alarm, and restart operation. Otherwise, injury may occur.

• If an absolute position erase alarm (AL.25) occurred, always make home position setting again. Otherwise, misoperation may occur.

POINT

• When any of the following alarms has occurred, always remove its cause and allow about 30 minutes for cooling before resuming operation. If operation is resumed by switching control circuit power off, then on to reset the alarm, the servo amplifier and servo motor may become faulty.

• Regenerative error (AL.30)
• Overload 1 (AL.50)
• Overload 2 (AL.51)

• The alarm can be deactivated by switching power off, then on press the “SET” button on the current alarm screen or by turning on the reset (RES).

For details, refer to Alarms and warning list.

Alarm definitions and causes

When an alarm occurs, the trouble (ALM) switches off and the dynamic brake is operated to stop the servo motor. At this time, the display indicates the alarm No.

The servo motor comes to a stop. Remove the cause of the alarm in accordance with this section. The optional servo configuration software may be used to refer to the cause.

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th>Definition</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL.10</td>
<td>Undervoltage</td>
<td>Power supply voltage dropped.</td>
<td>1. Power supply voltage is low.</td>
<td>Review the power supply.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MR-J2S-CP:160V or less</td>
<td>2. There was an instantaneous control power failure of 60ms or longer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MR-J2S-CP1:83V or less</td>
<td>3. Shortage of power supply capacity caused the power supply voltage to drop at start, etc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Power was restored after the bus voltage had dropped to 200VDC. (Main circuit power switched on within 5s after it had switched off.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Faulty parts in the servo amplifier</td>
<td>Change the servo amplifier.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Checking method</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alarm (AL.10) occurs if power is switched on after disconnection of all cables but the control circuit power supply cables.</td>
<td></td>
</tr>
<tr>
<td>AL.12</td>
<td>Memory error 1</td>
<td>RAM, memory fault</td>
<td>Faulty parts in the servo amplifier</td>
<td>Change the servo amplifier.</td>
</tr>
<tr>
<td>AL.13</td>
<td>Clock error</td>
<td>Printed board fault</td>
<td>Checking method</td>
<td></td>
</tr>
<tr>
<td>AL.15</td>
<td>Memory error 2</td>
<td>EEPROM fault</td>
<td>Alarm (any of AL.11 to 13 and 15) occurs if power is switched on after disconnection of all cables but the control circuit power supply cables.</td>
<td></td>
</tr>
<tr>
<td>AL.16</td>
<td>Encoder error 1</td>
<td>Communication error occurred between encoder and servo amplifier.</td>
<td>1. Encode connector (CN2) disconnected.</td>
<td>Connect correctly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Encoder fault</td>
<td>Change the servo motor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Encoder cable faulty (wire breakage or short)</td>
<td>Repair or change the cable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Wrong combination of servo amplifier and servo motor</td>
<td>Use correct combination.</td>
</tr>
</tbody>
</table>
# Chapter 1: Alarms

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th>Definition</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL.17</td>
<td>Board error</td>
<td>CPU/parts fault</td>
<td>Faulty parts in the servo amplifier</td>
<td>Change the servo amplifier.</td>
</tr>
<tr>
<td>AL.19</td>
<td>Memory error 3</td>
<td>ROM memory fault</td>
<td>Checking method</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alarm (A.17 or A.18) occurs if power is switched on after disconnection of all cables but the control circuit power supply cables.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL.1A</td>
<td>Motor combination error</td>
<td>Wrong combination of servo amplifier and servo motor.</td>
<td>Wrong combination of servo amplifier and servo motor connected.</td>
<td>Use correct combination.</td>
</tr>
<tr>
<td>AL.20</td>
<td>Encoder error 2</td>
<td>Communication error occurred between encoder and servo amplifier.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Encoder connector (CN2) disconnected.</td>
<td>Connect correctly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Encoder fault</td>
<td>Change the servo motor.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Encoder cable faulty (wire breakage or shorted)</td>
<td>Repair or change the cable.</td>
<td></td>
</tr>
<tr>
<td>AL.24</td>
<td>Main circuit error</td>
<td>Ground fault occurred at the servomotor outputs (U, V and W phases) of the servo amplifier.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Power input wires and servo motor output wires are in contact at main circuit terminal block (TE1).</td>
<td>Connect correctly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Sheathes of servo motor power cables deteriorated, resulting in ground fault.</td>
<td>Change the cable.</td>
<td></td>
</tr>
<tr>
<td>AL.25</td>
<td>Absolute position erase</td>
<td>Absolute position data in error</td>
<td>After leaving the alarm occurring for a few minutes, switch power off, then on again. Always make home position setting again.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Reduced voltage of super capacitor in encoder</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Battery voltage low</td>
<td>Change battery.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Battery cable or battery is faulty.</td>
<td>Always make home position setting again.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Super capacitor of the absolute position encoder is not charged</td>
<td>After leaving the alarm occurring for a few minutes, switch power off, then on again. Always make home position setting again.</td>
<td></td>
</tr>
<tr>
<td>AL.30</td>
<td>Regenerative alarm</td>
<td>Permissible regenerative power of the built-in regenerative brake resistor or regenerative brake option is exceeded.</td>
<td>Set correctly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Wrong setting of parameter No. 0</td>
<td>Connect correctly</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Built-in regenerative brake resistor or regenerative brake option is not connected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. High-duty operation or continuous regenerative operation caused the permissible regenerative power of the regenerative brake option to be exceeded.</td>
<td>1. Reduce the frequency of positioning. 2. Use the regenerative brake option of larger capacity. 3. Reduce the load.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Checking method</td>
<td>Call the status display and check the regenerative load ratio.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Power supply voltage is abnormal. MR-J2S-CP:260V or more MR-J2S-CP:135V or more</td>
<td>Review power supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Built-in regenerative brake resistor or regenerative brake option faulty.</td>
<td>Change servo amplifier or regenerative brake option.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regenerative transistor fault</td>
<td>6. Regenerative transistor faulty.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Checking method</td>
<td>1) The regenerative brake option has overheated abnormally. 2) The alarm occurs even after removal of the built-in regenerative brake resistor or regenerative brake option.</td>
<td></td>
</tr>
</tbody>
</table>

**HYDROBAR SPRINT 555**
<table>
<thead>
<tr>
<th>AL.31</th>
<th>Overspeed</th>
<th>Speed has exceeded the instantaneous permissible speed.</th>
<th>1. Input command pulse frequency exceeded the permissible instantaneous speed frequency.</th>
<th>Set command pulses correctly.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2. Small acceleration/deceleration time constant caused overshoot to be large.</td>
<td></td>
<td>Increase acceleration/deceleration time constant.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Servo system is instable to cause overshoot.</td>
<td>1. Re-set servo gain to proper value. 2. If servo gain cannot be set to proper value: 1) Reduce load inertia moment ratio; or 2) Re-examine acceleration/deceleration time constant.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Electronic gear ratio is large (parameters No. 4, 5)</td>
<td>Set correctly.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Encoder faulty.</td>
<td></td>
<td>Change the servo motor.</td>
</tr>
<tr>
<td>AL.32</td>
<td>Overcurrent</td>
<td>Current that flew is higher than the permissible current of the servo amplifier.</td>
<td>1. Short occurred in servo amplifier output phases U, V and W.</td>
<td>Correct the wiring.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Transistor (IPM) of the servo amplifier faulty.</td>
<td>Checking method Alarm (AL.32) occurs if power is switched on after U, V and W are disconnected.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. External noise caused the overcurrent detection circuit to misoperate.</td>
<td>Take noise suppression measures.</td>
<td></td>
</tr>
<tr>
<td>AL.33</td>
<td>Overvoltage</td>
<td>Converter bus voltage exceeded 400V.</td>
<td>1. Lead of built-in regenerative brake resistor or regenerative brake option is open or disconnected.</td>
<td>1. Change lead. 2. Connect correctly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Regenerative transistor faulty.</td>
<td>Change servo amplifier</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Wire breakage of built-in regenerative brake resistor or regenerative brake option</td>
<td>1. For wire breakage of built-in regenerative brake resistor, change servo amplifier. 2. For wire breakage of regenerative brake option, change regenerative brake option.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Capacity of built-in regenerative brake resistor or regenerative brake option is insufficient.</td>
<td>Add regenerative brake option or increase capacity.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Power supply voltage high.</td>
<td>Review the power supply.</td>
<td></td>
</tr>
<tr>
<td>AL.35</td>
<td>Command pulse frequency error</td>
<td>Input pulse frequency of the command pulse is too high.</td>
<td>1. Pulse frequency of the manual pulse generator is too high.</td>
<td>Change the pulse frequency to a proper value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Noise entered the pulses of the manual pulse generator.</td>
<td>Take action against noise.</td>
<td></td>
</tr>
<tr>
<td>AL.37</td>
<td>Parameter error</td>
<td>Parameter setting is wrong.</td>
<td>1. Servo amplifier fault caused the parameter setting to be rewritten.</td>
<td>Change the servo amplifier.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Regenerative brake option not used with servo amplifier was selected in parameter No.0.</td>
<td>Set parameter No.0 correctly.</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>Name</td>
<td>Definition</td>
<td>Cause</td>
<td>Action</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------</td>
<td>------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AL.45</td>
<td>Main circuit device overheat</td>
<td>Main circuit device overheat</td>
<td>1. Servo amplifier faulty.</td>
<td>Change the servo amplifier.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. The power supply was turned on and off continuously by overloaded status.</td>
<td>The drive method is reviewed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Air cooling fan of servo amplifier stops.</td>
<td>1. Exchange the cooling fan or the servo amplifier.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Reduce ambient temperature.</td>
</tr>
<tr>
<td>AL.46</td>
<td>Servo motor overheat</td>
<td>Servo motor temperature rise actuated the thermal protector.</td>
<td>1. Ambient temperature of servo motor is over 40°C.</td>
<td>Review environment so that ambient temperature is 0 to 40°C.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Servo motor is overloaded.</td>
<td>1. Reduce load.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Review operation pattern.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3. Use servo motor that provides larger output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Thermal protector in encoder is faulty.</td>
<td>Change servo motor.</td>
</tr>
<tr>
<td>AL.50</td>
<td>Overload 1</td>
<td>Load exceeded overload protection characteristic of servo amplifier.</td>
<td>1. Servo amplifier is used in excess of its continuous output current.</td>
<td>1. Reduce load.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Review operation pattern.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3. Use servo motor that provides larger output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Servo system is unstable and hunting.</td>
<td>1. Repeat acceleration/deceleration to execute auto tuning.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Change auto tuning response setting.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3. Set auto tuning to OFF and make gain adjustment manually.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Install limit switches.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Encoder faulty.</td>
<td>Change the servo motor.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Checking method When the servo motor shaft is rotated with the servo off, the cumulative feedback pulses do not vary in proportion to the rotary angle of the shaft but the indication skips or returns midway.</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>Name</td>
<td>Definition</td>
<td>Cause</td>
<td>Action</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AL.52</td>
<td>Error excessive</td>
<td>The droop pulse value of the deviation counter exceeded the encoder resolution $\times 10$ [pulse].</td>
<td>1. Acceleration/deceleration time constant is too small.</td>
<td>Increase the acceleration/deceleration time constant.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Internal torque limit 1 (parameter No.28) is too small.</td>
<td>Increase the torque limit value.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Motor cannot be started due to torque shortage caused by power supply voltage drop.</td>
<td>1. Review the power supply capacity. 2. Use servo motor that provides larger output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Position control gain 1 (parameter No.7) value is small.</td>
<td>Increase set value and adjust to ensure proper operation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Servo motor shaft was rotated by external force.</td>
<td>1. When torque is limited, increase the limit value. 2. Reduce load. 3. Use servo motor that provides larger output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7. Encoder faulty</td>
<td>Change the servo motor.</td>
</tr>
<tr>
<td>AL.8A</td>
<td>Serial communication time-out error</td>
<td>RS-232C or RS-422 communication stopped for longer than the time set in parameter No.23.</td>
<td>1. Communication cable breakage.</td>
<td>Repair or change communication cable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Communication cycle longer than parameter No. 23 setting.</td>
<td>Set correct value in parameter.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Wrong protocol.</td>
<td>Correct protocol.</td>
</tr>
<tr>
<td>AL.8E</td>
<td>Serial communication error</td>
<td>Serial communication error occurred between servo amplifier and communication device (e.g. personal computer).</td>
<td>1. Communication cable fault (Open cable or short circuit)</td>
<td>Repair or change the cable.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Communication device (e.g. personal computer) faulty</td>
<td>Change the communication device (e.g. personal computer).</td>
</tr>
<tr>
<td>88888</td>
<td>Watchdog</td>
<td>CPU, parts faulty</td>
<td>Fault of parts in servo amplifier</td>
<td>Change servo amplifier.</td>
</tr>
</tbody>
</table>

Checking method: Alarm (88888) occurs if power is switched on after disconnection of all cables but the control circuit power supply cables.
## Remedies for warnings

If AL.E6 occurs, the servo off status is established. If any other warning occurs, operation can be continued but an alarm may take place or proper operation may not be performed. Use the optional servo configuration software to refer to the cause of warning.

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th>Definition</th>
<th>Cause</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL.90</td>
<td>Home position return incomplete</td>
<td>In incremental system: 1. Positioning operation was performed without home position return. 2. Home position return ended abnormally.</td>
<td>1. Positioning operation was performed without home position return. 2. Home position return speed could not be decreased to creep speed. 3. Limit switch was actuated during home position return starting at other than position beyond dog.</td>
<td>1. Perform home position return. 2. Review home position return speed/creep speed/moving distance after proximity dog.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In absolute position detection system: 1. Positioning operation was performed without home position setting. 2. Home position setting ended abnormally.</td>
<td>1. Positioning operation was performed without home position setting. 2. Home position setting speed could not be decreased to creep speed. 3. Limit switch was actuated during home position setting starting at other than position beyond dog.</td>
<td>1. Perform home position setting. 2. Review home position setting speed/creep speed/moving distance after proximity dog.</td>
</tr>
<tr>
<td>AL.92</td>
<td>Open battery cable warning</td>
<td>Absolute position detection system battery voltage is low.</td>
<td>1. Battery cable is open. 2. Battery voltage dropped to 2.8V or less.</td>
<td>Repair cable or changed. Change battery.</td>
</tr>
<tr>
<td>AL.96</td>
<td>Home position setting warning</td>
<td>Home position setting could not be made.</td>
<td>1. Droop pulses remaining are greater than the in-position range setting. 2. Command pulse entered after clearing of droop pulses. 3. Creep speed high.</td>
<td>Remove the cause of droop pulse occurrence. Do not enter command pulse after clearing of droop pulses. Reduce creep speed.</td>
</tr>
<tr>
<td>AL.98</td>
<td>Software limit warning</td>
<td>Software limit set in parameter is reached.</td>
<td>1. Software limit was set within actual operation range. 2. Point table of position data in excess of software limit was executed. 3. Software limit was reached during JOG operation or manual pulse generator operation.</td>
<td>Set parameter No. 48 to 51 correctly. Set point table correctly. Perform operation within software limit range.</td>
</tr>
<tr>
<td>AL.9F</td>
<td>Battery warning</td>
<td>Voltage of battery for absolute position detection system reduced.</td>
<td>Battery voltage fell to 3.2V or less.</td>
<td>Change the battery.</td>
</tr>
<tr>
<td>AL.E0</td>
<td>Excessive regenerative warning</td>
<td>There is a possibility that regenerative power may exceed permissible regenerative power of built-in regenerative brake resistor or regenerative brake option.</td>
<td>Regenerative power increased to 85% or more of permissible regenerative power of built-in regenerative brake resistor or regenerative brake option.</td>
<td>1. Reduce frequency of positioning. 2. Change regenerative brake option for the one with larger capacity. 3. Reduce load.</td>
</tr>
<tr>
<td>AL.E1</td>
<td>Overload warning</td>
<td>There is a possibility that overload alarm 1 or 2 may occur.</td>
<td>Load increased to 85% or more of overload alarm 1 or 2 occurrence level.</td>
<td>Refer to AL.50, AL.51.</td>
</tr>
<tr>
<td>AL.E3</td>
<td>Absolute position counter warning</td>
<td>Absolute position encoder pulses faulty.</td>
<td>1. Noise entered the encoder. 2. Encoder faulty.</td>
<td>Take noise suppression measures. Change servo motor.</td>
</tr>
<tr>
<td>AL.E6</td>
<td>Servo emergency stop warning</td>
<td>EMG-SG is open.</td>
<td>External emergency stop was made valid. (EMG-SG opened.)</td>
<td>Ensure safety and deactivate emergency stop.</td>
</tr>
<tr>
<td>AL.E9</td>
<td>Main circuit off warning</td>
<td>Servo was switched on with main circuit power off.</td>
<td></td>
<td>Switch on main circuit power.</td>
</tr>
</tbody>
</table>
The Hydrobar Sprint 555 is designed to be a user-friendly, simple, and reliable bar feeder, covering a range of diameters 0.250” to 2.000” (up to 2.125” with bar end preparation). Although easy to use, including extremely quick changeovers and the capability for unmanned operation this unit is not flawless. A list of common issues that have been documented by service technicians and problems relayed back from customers has been compiled in this manual. This chapter discusses the most common problems that have been observed. Along with each problem, a brief description is given as well as quick reference charts of symptoms/solutions, sequences, and procedures for adjustments, changeovers and alignment.
### Low Voltage / PLC Shutdown

**Description:**

The Hydrobar Sprint 555 uses a SAIA PCD2 controller (PLC) to send/receive inputs/outputs. The PLC is powered by a +24VDC input supplied by a transformer. The input supply voltage must be regulated to ensure proper functioning. The remote control station, which is used to send/receive data back and forth with the PLC, is powered by the +24VDC on the PLC.

Through the remote control station, the user can command the bar feeder to perform different functions by sending data to the PLC. The PLC will then transfer data back to the remote control station to either inform the user the status of what the bar feeder is doing or is waiting for the user to command the next task.

The following chart discusses possible problems, which may be occurring between the PLC and the remote control station:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause/s</th>
<th>Solution/s</th>
</tr>
</thead>
</table>
| SPS No response | - The PLC toggle switch is not in the RUN position  
- A sudden drop in the supply voltage has caused a communication problem between the PLC and the remote control station  
- The battery was either removed or battery voltage was low while the bar feed was powered down which caused the PLC to lose its program | - Flip the toggle switch on the PLC to the RUN position  
- Check the supply voltage on the PLC, can be low due to a low incoming 3 phase voltage from the lathe  
- Check the battery voltage, if it is low it will need to be replaced with a 3VDC Litium/CD2032 battery and the program will need to be restored (refer to Chapter 4) |
| No operator action possible on the remote control station | - The PLC toggle switch is not in the RUN position  
- Low supply voltage on the PLC | - Flip the toggle switch on the PLC to the RUN position  
- Check the supply voltage on the PLC, can be low due to a low incoming 3 phase voltage from the lathe |
Chapter 2: Common Issues

Cannot Change Application Setup Parameters

In order to change the values of any parameters in the bar feed, it must be in “STOP” mode. To determine whether the bar feed is in “STOP” mode, look at the “STOP” key on the remote control station. When the “STOP” key is pressed, two red LED’s will illuminate on either side of the remote.

In certain cases, as a precaution, the bar feed will not allow the parameters in the PARAMETERS RELATED TO APPLICATION menu to be changed unless a few conditions are met. The following conditions are required to change these parameters:

- Guiding channels must be open.
- Bar stock (if any) must be removed.

When removing the bar stock, the bar feed must recognize that the bar has been removed. In order for the bar feed to recognize that the bar has been removed follow the steps below:

Step 1: Press the manual mode icon.

Step 2: Press the remove bar stock icon. Note: If the remove bar stock icon is not present, skip the next step and go to Step 4.

Step 3: After pressing the remove bar stock icon, it will ask you to verify if the bar has been removed. Remove the bar from the channel and press and hold the confirmation icon.

Step 4: Press the “STOP” key on the remote control station and proceed with changing the parameters.

Multiple Bars have been Loaded into the Channel

Two bars loaded at a time

<table>
<thead>
<tr>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch SQ9 is out of adjustment.</td>
<td>Adjust switch SQ9.</td>
</tr>
</tbody>
</table>

HYDROBAR SPRINT 555
Rotating Sleeves

Description:

The Hydrobar Sprint 555 is equipped with a rotating sleeve mounted on the front end of the pushing rod. The rotating sleeve is to ensure that the bar stock rotates with virtually zero friction during ideal running conditions. However, since there is no such thing as perfect running conditions, these parts will eventually wear down. Factors that will influence the life expectancy of the rotating sleeve is; RPM, operating hours, alignment, straightness of bar stock, material (ex. brass, copper, aluminum), profiled material (ex. round, hex, square), oil cleanliness, excessive vibration, and shocks.

Due to the rotating sleeves being a wear item, it can inhibit the bar feeder to run as efficiently as it was designed. The determining factors indicating whether the rotating sleeve is showing signs of wear are usually visual signs.

The following chart discusses possible problems that might be occurring with the bar feeder due to the rotating sleeves:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause/s</th>
<th>Solution/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>The rotation of the sleeve is no longer smooth.</td>
<td>• Misalignment between the lathe and bar feed.</td>
<td>• Check the alignment of the bar feed (refer to pg. 2- for alignment procedure).</td>
</tr>
<tr>
<td></td>
<td>• Excessively bent material.</td>
<td>• Check the straightness of the bar stock. (Bar stock specification, .020 over three feet, not to accumulate.)</td>
</tr>
<tr>
<td></td>
<td>• Excessive pushing force.</td>
<td>• Replace the rotating sleeve (refer to Recommended Spare Parts List pg. 6-2 and Parts Order Form pg. 6-5).</td>
</tr>
<tr>
<td>The sleeve has completely frozen up.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The rotating sleeve is discolored (bluish color).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Collets**

**Description:**

The Hydrobar Sprint 555 bar feeder is equipped with a collet on the front of the pushing rod in which the bar stock is inserted mechanically during top-cut positioning. The collet grips the bar stock so that once the last piece has been cut off the remnant can be removed by the bar feeder, and for Swiss style machines so the pusher stays with the bar stock while the machine makes its Z-axis movements. Once the material has been consumed, the remnant is pulled back through the spindle; it is extracted from the collet of the pushing rod, and dropped in the remnant tray. The bar feed indexes the chain magazine rack; the carrier flag advances the bar forward in front of the pusher; the vise grabs the bar stock and the carrier flag returns home; the guiding channel closes and the new bar is inserted into the collet and advances the new bar to top-cut position. This cycle is continued until there is no bar stock left on the magazine.

Due to the collet being a wear item, after a period of time where the collet will expand and contract for each bar that is inserted and extracted, the collet will eventually lose its ability to grip the bar how it is designed to grip. Inserting and extracting an unprepared bar can severely reduce the life expectancy of the collet.

The following chart discusses possible problems that might be occurring with the bar feeder due to the collet:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause/s</th>
<th>Solution/s</th>
</tr>
</thead>
</table>
| The remnant remains in the spindle when the pusher is retracting to the home position. | • Collet has been damaged and will no longer hold bar stock.  
• Collet is too large for bar stock. | • Check collet for damage and make sure the collet I.D. is the right size for bar stock (refer to Guiding Channel Reference Chart in the Hydorbar Sprint 555 Instruction Manual). |
| Bar stock will not insert into collet. | • Collet is too small for bar stock.  
• Collet has been damaged. | • Check collet for damage and make sure the collet I.D. is the right size for bar stock (refer to Guiding Channel Reference Chart in the Hydorbar Sprint 555 Instruction Manual). |
| Bar stock will not extract from collet. | • Bar stock has been pushed into the throat of the collet.  
• Hardness of the material.  
• End of bar stock has become misshapen. | • Check to make sure that vise jaws grip the bar stock.  
• Check collet for damage and make sure the collet I.D. is the right size for bar stock (refer to Guiding Channel Reference Chart in the Hydorbar Sprint 555 Instruction Manual). |
Front Rest Issues

How the front rest works?
The front rest is used as a guide source for the bar stock to transfer from the bar feed through the headstock. The rest also acts as an extended support for the back of the bar while the spindle is rotating. It operates using an electric motor which drives the "jaws" open and closed. There are three operating positions at which the rest will open/close:

"Home" reference position - this is a constant position at which the rest will open up completely to a zero-position which calibrates the rest. This position is determined by a mechanical setting which is detected by a fixed proximity switch (SQ13).

Bar stock diameter position - this is a variable position at which the rest will close down to approximately (.020") over the bar stock diameter. This position is automatically calculated when the bar stock diameter parameter is entered in.

Guiding channel position - this is a variable position at which the rest will open up to the I.D. of the guiding channel inserts. The rest opens to this position in order for the pusher (since the pusher O.D. is greater than the bar stock O.D.) to be able to travel through the rest. This position is automatically calculated when the guiding channel parameter is entered in.

Front Rest Opening/Closing Timing Chart

<table>
<thead>
<tr>
<th>Sequence</th>
<th>During Loading Sequence</th>
<th>During Production Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remnant is being measured</td>
<td>Remnant is being extracted</td>
</tr>
<tr>
<td>&quot;Home&quot; reference position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bar stock diameter position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guiding channel position</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Symptoms of front rest mal-functioning

<table>
<thead>
<tr>
<th>Description</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
</table>
| Front rest is locked in the “home” ref. position | - The front rest has been manually locked open.  
- Mechanical obstruction has caused a front rest error. | ➔ Must be manually closed. Refer to pg. 3-3 Front Rest Override procedure.  
➔ Remove any debris which may have caused a mechanical obstruction. |
| Front rest is closing too tight on bar stock / pusher. | - Bar stock diameter / guiding channel size has not been set correctly in the parameters.  
- SQ14 switch is mis-adjusted or defective.  
- Front rest is mis-calibrated (SQ13). | ➔ Check the bar stock diameter and guiding channel size parameters.  
➔ Check the functionality of the SQ14 switch. |
| Front rest is not closing enough on the bar stock | - Bar stock diameter / guiding channel size has not been set correctly in the parameters.  
- SQ13 switch is mis-adjusted or defective.  
- Front rest is mis-calibrated. | ➔ Check the bar stock diameter and guiding channel size parameters.  
➔ Check the functionality of the SQ14 switch. |
Vibration Issues

The term “vibration” is being used regarding the Hydrobar Sprint 555, to indicate that the RPM performance of the lathe is physically deteriorated, to the point of creating an unbalanced rotational oscillation of the bar stock that is detrimental to the machining process. Various items can cause the bar stock to vibrate, requiring the reduction of the spindle rpm to bring the anomaly back to a normal controlled rotation. These items can be related (but not limited to) the material, the lathe, the spindle reduction tubes, or the bar feed.

Material
The material must be reasonably straight. LNS has a specification of .5mm / meter (non-accumulative).
If the material is a hot roll type it will not meet our specifications.
If the material has been “cropped” to length the last 6”-12” of the end of the bar may be unusable due to being bent severely in the process.
Note: Also, there is a possibility to have a severe angle on the end of the bar, which has been cropped. This might cause the mis-loading of a new bar into the collet of the bar feed.
When running profiled material (hex, square, etc.), vibration is more likely to occur due to the physical properties of the material, especially with extremely odd shaped material, in which case a lower rpm is recommended.
The composition of the material also has an effect on the guiding of bar stock. Steel and aluminum bars are relatively easy to guide, but because of the flexibility and specific weight of brass it is generally going to be more difficult to guide at high speeds.

Lathe
The lathe should be level and on a solid foundation. LNS recommends that the lathe be bolted to the floor.

Spindle Reduction Tube
Ensure that the properly sized spindle liner has been installed (matches guiding channel size).
Ensure that the spindle liner is straight (check total run out).
Ensure that the liner is securely fastened.

Bar Feed
The bar feed must be within proper alignment to the spindle of the lathe.
The proper guiding elements should be used to provide minimal gap between the I.D. of the elements and the O.D. of the bar stock diameter. Should not exceed 10mm overall gap (5mm per side). Refer to the Guiding Channel Reference Chart in the Hydrobar Sprint 555 Instruction Manual for the recommended guiding elements and ordering numbers.
LNS recommends running ISO 100 hydraulic oil in the bar feed. In certain cases, a thicker oil (ISO 150) may produce better results when guiding profiled material.
The following chapter includes simple step-by-step procedures for mechanical adjustments, replacing damaged or faulty components and to resolve other issues related to the bar feeder. Along with some of these procedures are video clips which show the actual procedure being performed in case the written procedure is too difficult to follow. The video clips can be viewed on a PC with a compatible video card from the CD-ROM version of this manual.


Front Rest Override

Overriding the front rest can be used as a temporary solution if a problem should ever arise with calibration or misalignment. The front rest override parameter locks the front rest in the open position and allows the user to run any operation with the bar feeder until the problem can be corrected properly. However, there are disadvantages to running production with the front rest locked open. Excess vibration can occur during machining due to the absence of stabilization that the front rest would normally provide. Also, when loading a new bar, depending on how sturdy the bar stock is, there is a possibility of sagging or drooping between the end of the guiding channel and the back of the spindle. This creates a problem with transferring the bar from the bar feeder to the lathe because the front rest also aids in supporting and guiding the bar into the spindle.

Disable Procedure

Conditions:

- The bar feeder must be in STOP mode.
- The guiding channels must be open.

Step 1: Press the MENU button on the remote station.

Step 2: Press F4 (PAGE DOWN) function key to Parameters Related to Miscellaneous Functions. Press the F3 (ENTER) function key on the remote station.

Step 3: Press F4 (PAGE DOWN) function key to Front Rest Opening and Closing Control to Replace Rest Guiding Insert or Rest Calibration (Service Only) menu. Press the F3 (ENTER) function key on the remote station.

Step 4: To override the front rest, press the F4 (PAGE DOWN) function key. The remote station should appear like the second figure below and should say that it is enabled. Press and hold the “X” until the front rest becomes disabled, as shown in the third figure.
Note: After having completed Step 4, the front rest is now locked in the open position. The front rest will remain in the open position during any operation of the bar feeder until the override has been deactivated. The front rest is now disabled.

Step 5: Press STOP to exit and return to the main menu.

Enable Procedure

Conditions:
• The bar feeder must be in STOP mode.

Step 1: Press the MENU button on the remote station.

Step 2: Press F4 (PAGE DOWN) function key to Parameters Related to Miscellaneous Functions. Press the F3 (ENTER) function key on the remote station.

Step 3: Press F4 (PAGE DOWN) function key to Front Rest Opening and Closing Control to Replace Rest Guiding Insert or Rest Calibration (Service Only). Press the F3 (ENTER) function key on the remote station.

Step 4: To deactivate the override, press the F4 (PAGE DOWN) function key. The remote station should appear like the second figure below and is should say that it is disabled. Press and hold the "9" until the front rest becomes enabled, as shown in the third figure.

Note: After having completed Step 4, the front rest is no longer locked in the open position. The front rest is now enabled.

Step 5: Press STOP to exit and return to the main menu.

Procedure complete.
Reference Procedure

The purpose of this procedure is to reset the pusher into home position.

Procedure

Conditions:
- Channels open
- Bar stock extracted

Step 1: Select REQUEST FOR REFERENCE POINT in the PARAMETERS RELATED TO MISCELLANEOUS FUNCTIONS menu and follow the on screen instructions.

Step 2: Press the F1 button to select manual mode operation.

Step 3: Press the F1 button (reference icon) and the carrier flag will travel toward the home position. Once the flag has reached the home position (verified by switch SQ5-input I0.7), the reference sequence is complete.

Procedure complete.
Chapter 3: Procedures

Adjustment Procedure for End of Bar

This procedure is used to set the end of bar and obtain the shortest remnant length.

Procedure

Conditions:
- Main bar feed power on
- Air pressure set at 6 bar
- No bar stock in the guiding channel
- Bar feed in STOP mode

Step 1: Press the MENU key on the display.

Step 2: Press F4 (PAGE DOWN) until the PARAMETERS RELATED TO POSITIONING screen is displayed and press F3 (ENTER).

Step 4: On the next screen, press F2 (TEACH IN) to teach in the end of bar position.

Step 5: Position the headstock on the lathe in the forward cut-off position (normally 1/2" from the guide bushing). This position will give you the shortest remnant length. Certain applications may require different settings.

Step 6: Press and hold the F-key corresponding to the pusher forward icon until the pusher is 1/2" behind the main collet.

Step 7: Once the desired position is reached, press and hold F3 (ENTER) to set the end of bar position.

Step 8: Press F2 (ESC) to exit the menu.

Procedure complete.
Top Cut Position Adjustment

This procedure is used to set top cut position. The setting for the top cut position may be adjusted in one of two ways: by offset correction; by teach in.

Procedure

Conditions:
- Main bar feed power on.
- Main guiding channel open
- Bar stock in the magazine rack.
- Clamping device of the lathe open.
- Bar feed is in STOP mode.

By offset correction:

Step 1: Press the STOP key.
Step 2: Press the MENU key.
Step 3: Press F4 twice (PAGE DOWN) till the Parameters Related to Positioning is displayed.
Step 4: Press F3 (ENTER) to enter into the Parameters Related to Positioning menu.
Step 5: Press F4 (PAGE DOWN) until the Top Cut Position is displayed.
Step 6: Press F3 (SET) to set or make changes to top cut position.
Step 7: Press F1 (+/-) to enter by offset correction.

Step 8: Enter the correction value with the numerical keys. Then press the F1 key (+) to add the value, or press the F4 key (-) to subtract it. The display will read the new top cut position.

Step 9: To exit the top cut set mode, press F2 (ESC).

By Teach In:
Step 1: On a clear screen, press F1 (MANUAL MODE).
Step 2: Press F1 to load a bar.

Step 3: Press the STOP key.

Step 4: Press the MENU key.

Step 5: Press F4 twice (PAGE DOWN) till the Parameters Related to Positioning is displayed.

Step 6: Press F3 (ENTER) to enter into the Parameters Related to Positioning menu.

Step 7: Press F4 (PAGE DOWN) until the Top Cut Position is displayed.

Step 8: Press F3 (SET) to set or make changes to top cut position.
Step 9: Press F2 (TEACH IN) to enter the top-cut by teach in.

Step 10: Press F1 (START). The movable vise closes and advances the bar stock against the front stopper. The bar is thus measured. The movable vise continues its travel and positions the bar inside the spindle of the lathe. The guiding channel closes. The feeding pusher is now facing the bar. The movable vise moves back and positions the material inside the collet of the bar feed system.

Step 11: Press the F1 (FWD) key and advance the bar stock to the desired position.
Chapter 3: Procedures

Step 12: To validate the new top cut position, keep F3 (ENTER) pressed until the ENTER icon disappears.

Step 13: To exit the set mode, press the STOP key.

Procedure complete.
With the help of the latest technological innovations, it is possible to update new software and restore lost data through the use of Smart Media. Smart Media, which is mainly used in photography, has been integrated for use with the user-friendly remote control station. The Smart Media Card holds a backup program for the Hydrobar Sprint 555 if at anytime there has been a power failure or any error has occurred in the user program. In addition, it automatically backs up any application/interface parameters that have been set for the most recent application being ran. Following a few systematic procedures is all it takes to be up and running with the most up to date software or restoring lost PLC programs and/or parameters.
PLC Fault – v2.08

This procedure is used due to a defective battery or a new PLC was installed.

Procedure

Step 1: Turn off the power to the bar feed.

Step 2: Make sure the RUN/STOP switch on the PLC is in the RUN position.

Step 3: Remove the 9 screws on the back of the pendant, and then carefully separate the back half from the front half.

Step 4: Once the 2 halves are separated insert the Smart Media card (solid back side facing up and chamfered edge away from you) into the slot.
Step 5: Press and hold the menu button while turning on the bar feed. You may release the menu button when the following screen appears.

![Menu screen](image)

Step 6: Wait until the PLC run light indicator goes from a flashing to a solid state. (This may take a few seconds.)

Step 7: Once the light is in a solid state, flip the RUN/STOP switch to STOP position. (The run light indicator will turn off)

Step 8: A password is required at this point using the number buttons on the pendant enter 3; 1; 4; 1; 5.

![Password screen](image)

Step 9: There are 4 menu choices on this screen, press the F3 key for PLC Fault.

![Menu choices](image)
Step 10: When the PLC fault screen appears (seen below) press the F3 key (ENTER).

Step 11: The current parameter settings will be saved. The display will then restore the PLC program to the PLC and the parameters will then be restored to their previous settings.


Step 13: Turn off power to bar feeder

Step 14: Move the RUN/STOP switch to RUN position.

Step 15: Restore power to the bar feeder.

Procedure complete.
### Software Update – v2.08

This procedure is used to update the PLC software.

**Procedure**

Step 1: Turn off the power to the bar feed.

Step 2: Make sure the RUN/STOP switch on the PLC is in the RUN position.

Step 3: Remove the 9 screws on the back of the pendant, and then carefully separate the back half from the front half.

Step 4: Once the 2 halves are separated insert the Smart Media card (solid back side facing up and chamfered edge away from you) into the slot.
Step 5: Press and hold the menu button while turning on the bar feed. You may release the menu button when the following screen appears.

```
AartecAC
Konsole
K8310
Password
```

Step 6: Wait until the PLC run light indicator goes from a flashing to a solid state. (This may take a few seconds.)

Step 7: Once the light is in a solid state, flip the RUN/STOP switch to STOP position. (The run light indicator will turn off)

Step 8: A password is required at this point using the number buttons on the pendant enter 3; 1; 4; 1; 5.

```
AartecAC
Konsole
K8310
Password
xxxx
```

Step 9: There are 4 menu choices on this screen, press the F2 key for Software Update.

```
1 Display Adjust
2 Software Update
3 PLC Fault
4 LNS Service Only
Press Appropriate F-key To Select
```

1 2 3 4
Step 10: When you have reached the Update PLC screen press the F3 key (ENTER).

Step 11: The current parameter settings will be saved. The PLC program will then be updated and the parameters will then be restored to their previous settings.


Step 13: Turn off power to bar feeder

Step 14: Move the RUN/STOP switch to RUN position.

Step 15: Restore power to the bar feeder.

Procedure complete.
Periodic maintenance of the Hydrobar Sprint 555 bar feeding system can only serve to improve the operation and prolong its useful life. Following a few simple steps can be extremely helpful and takes relatively no time at all. The list of maintenance procedures has been broken down into four groups determined by the frequency with which each procedure should be followed, however, some items should be checked more often depending on the operating environment that the equipment is exposed.
Daily Maintenance

Verify the Air Pressure
The recommended setting for operation with optimum performance should be at a minimum pressure of 5 bar (75 psi.) and a maximum pressure of 6 bar (90 psi.).

Weekly Maintenance

Verify that the Air Decanter is Empty
The air-filtering device is equipped with an automatic drainage valve, but depending on how much water is in the pneumatic circuit of the building, the water that is recuperated can build up faster than it can be drained. Excess water in the air lines can cause pneumatic cylinders to become defective. The water causes the o-rings inside the cylinder to swell up and no longer function correctly.

Hydraulic Oil Level
When checking the level of the hydraulic oil, allow the bar feed to set idle for at least one hour so that the oil inside the coffin has time to drain back into the tank. If the oil is not allowed this time to drain back into the tank, the tank may look low, and if the oil is added it may cause an overflow.

Monthly Maintenance

Cleaning of the bar feeder
Wipe down the outside of the bar feeder with a cloth and any regular detergent, for cleaning the inside of the bar feed use a cloth or brush. However, do not use the detergents on any of the guiding channels or any other parts made of synthetic materials. The use of compressed air for cleaning is not advisable, because chips and other particles can become lodged in sensitive areas and can impede the proper operation of the bar feeder.

Hydraulics
Check the cleanliness of the hydraulic oil. It is important to wipe down the bars (even briefly) before loading them on the magazine rack. The bar feed recirculates the oil; excessive dirt and metal chips can form a deposit at the base of the coffin which can slow the oil return. The metal chips can also become lodged in the hydraulic pump causing the pump to lock up and/or the pump motor to overheat.

Rotating sleeves
In order to guarantee the correct operation of the bar feeder, the rotating sleeve must function perfectly. Although the construction of the sleeve is very sturdy and reliable, it is recommended to verify periodically that it rotates without friction. If a defect should be present, please contact your local agent. This is a wear item and it is recommended to keep spares on hand, refer to Recommended Spare Parts List pg. 6-2.

Drive belt
Over time, it is possible that the tension of the drive belt may loosen up. To tighten the belt, refer to Belt Tension Adjustment.
Annual Maintenance

Check the PLC battery

The PLC backup battery saves the PLC program in case of any power failure. The battery used in the SAIA PCD1 is a non-rechargeable 3VDC Lithium/CD2032 battery. Over time, the battery will slowly discharge and an alarm message will appear on the remote control station (Low PLC Battery pg. 2-2). The following chart shows the average life expectancy of the battery:

<table>
<thead>
<tr>
<th>Use of Automation</th>
<th>Avg Life Expectancy: 25°C</th>
<th>Avg Life Expectancy: 55°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% off</td>
<td>0% on</td>
<td>3 years</td>
</tr>
<tr>
<td>0% off</td>
<td>100% on</td>
<td>5 years</td>
</tr>
<tr>
<td>30% off</td>
<td>70% on</td>
<td>4 years</td>
</tr>
</tbody>
</table>

Verify the alignment of the bar feeder

Check alignment of bar feeder to lathe spindle to make sure neither have shifted.
Chapter 6:
Spare Parts

Note: When ordering parts the following information will be needed to ensure better customer support:

- Bar feeder type
- Bar feeder Serial Number (found on the hydraulic tank next to the air regulator)
- Bar stock diameter
- Lathe type (make and model)
Revised Spare Parts List

As an extended courtesy, a list of recommended spare parts has been compiled for the end user. The list consists of mechanical and electrical parts that over time may become faulty due to everyday wear on the item. For machines that are running production during multiple shifts or even 24/7, keeping an inventory of these spare parts can vastly minimize downtime. Keeping an inventory can also be very cost effective since shipping costs can escalate immensely, especially in cases where rush delivery is necessary.

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Order #</th>
<th>Part #</th>
<th>Drawing #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6E40-010</td>
<td>015.031.013/10</td>
<td>015.031.013/10</td>
<td>10MM Rotating sleeve</td>
</tr>
<tr>
<td>1</td>
<td>6E40-015</td>
<td>015.031.013/15</td>
<td>015.031.013/15</td>
<td>15MM Rotating sleeve</td>
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<tr>
<td>1</td>
<td>6E40-025</td>
<td>015.015.814</td>
<td>015.015.814</td>
<td>25MM Rotating sleeve</td>
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<tr>
<td>1</td>
<td>0552-024-013</td>
<td>052-024-013</td>
<td>052-024-013</td>
<td>36MM Rotating sleeve</td>
</tr>
<tr>
<td></td>
<td>6.102-A</td>
<td>6.102-A</td>
<td>N/A</td>
<td>R1-R5 Relay</td>
</tr>
<tr>
<td>1</td>
<td>4.391</td>
<td>4.391</td>
<td>N/A</td>
<td>SQ2 / SQ5 / SQ8 prox. switch</td>
</tr>
<tr>
<td>1</td>
<td>4.790</td>
<td>4.790</td>
<td>N/A</td>
<td>SQ3 / SQ4 / SQ6 / SQ7 proximity switch</td>
</tr>
<tr>
<td>1</td>
<td>4.772</td>
<td>4.772</td>
<td>N/A</td>
<td>SQ1 / SQ9 / SQ12 optical switch (w/ adjustable gain)</td>
</tr>
<tr>
<td>1</td>
<td>4.763</td>
<td>4.763</td>
<td>N/A</td>
<td>SQ10 / SQ11 limit switch</td>
</tr>
<tr>
<td>1</td>
<td>4.773</td>
<td>4.773</td>
<td>N/A</td>
<td>SQ15 magnetic limit switch</td>
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<tr>
<td>1</td>
<td>3.329</td>
<td>3.329</td>
<td>N/A</td>
<td>SQ16 reflector switch (optical cell)</td>
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<tr>
<td>1</td>
<td>6.100-A</td>
<td>6.100-A</td>
<td>N/A</td>
<td>KM1/2 motor contactor</td>
</tr>
</tbody>
</table>

When ordering parts, to ensure better customer support, please specify the following information:

Type of bar feeder, bar feeder serial number, bar stock diameter, and lathe type (refer to pg. 6-5 Parts Order Form).

Spindle Liners

Ensure that the properly sized spindle liner has been installed (.030" - .060" over bar stock size).

Ensure the liner is straight (check total run out), and has all o-rings intact.
**Guiding Channel Performance Chart (w/o remnant retraction)**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Flag</th>
<th>Coupling</th>
<th>Drapeau</th>
<th>Führungselemente</th>
<th>Koppelschraube</th>
<th>Faia</th>
<th>Faia</th>
<th>Faia</th>
<th>Faia</th>
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<td>16</td>
<td>18</td>
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<td>50</td>
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<td>54</td>
</tr>
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<td>56</td>
<td>58</td>
</tr>
</tbody>
</table>

**HYDROBAR SPRINT 555**

without remnant retractor system and without hose stop retainer

---

**Bearing Elements**

- 

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**SPRINT 555**

- Best guiding performance without remnant retraction
- Best performance du guidage sans remnant de rétraction
- Best guiding performance without remnant retraction
- Best performance du guidage sans remnant de rétraction
<table>
<thead>
<tr>
<th>Material</th>
<th>Bearing elements</th>
<th>Pushers</th>
<th>Rotating sleeve</th>
<th>Flag</th>
<th>Coquilles</th>
<th>Poussoir</th>
<th>Embout tournant</th>
<th>Drapeau</th>
<th>Führungselemente</th>
<th>Glassele</th>
<th>Drehteil</th>
<th>Kupplungsteil</th>
<th>Fahne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barock Baren</td>
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</tr>
</tbody>
</table>

**SPRINT 555**

with remnant retract system / avec retraction chute / mit Reststückrückzug

Chapter 6: Spare Parts

Guiding Channel Performance Chart (with remnant retraction)
Parts Order Form

LNS America, Inc.

Date: _________________

P.O. # _________________

Phone #: ____________________

Bill to: ____________________ Ship to: ____________________

Contact: ____________________ Attn: ____________________

Ship via: ____________________

Model of Bar feeder: __________ Serial # of Bar feeder: __________

Model of Lathe: ______________ Bar stock diameter: __________

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Note: To place an order, this form should be photocopied, completed and faxed to (513) 528-8320
Please call (513) 528-5674 for price and availability of parts.
### Electrical Box Components

<table>
<thead>
<tr>
<th>Designation</th>
<th>Ordering no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.271</td>
<td>Interface connecting terminal blocks</td>
</tr>
<tr>
<td>B</td>
<td>4.414</td>
<td>Connecting terminal blocks YV1 – YV4</td>
</tr>
<tr>
<td>C</td>
<td>4.271</td>
<td>Connecting terminal blocks XT1 – XT11</td>
</tr>
<tr>
<td>D</td>
<td>4.710</td>
<td>Programmable controller SAIA PCD2 (PLC)</td>
</tr>
<tr>
<td>K1</td>
<td>4.610</td>
<td>Safety contactor</td>
</tr>
<tr>
<td>AJ1*</td>
<td>4.705</td>
<td>Servo amplifier 400W</td>
</tr>
<tr>
<td>KA1*</td>
<td>4.606</td>
<td>Guiding elements closing motor M4 relay</td>
</tr>
<tr>
<td>KA2*</td>
<td>4.606</td>
<td>Guiding elements opening motor M4 relay</td>
</tr>
<tr>
<td>KA3</td>
<td>4.606</td>
<td>Guiding elements locking motor M5 relay</td>
</tr>
<tr>
<td>KA4</td>
<td>4.606</td>
<td>Guiding elements unlocking motor M5 relay</td>
</tr>
<tr>
<td>KM1</td>
<td>4.507</td>
<td>Hydraulic pump motor M1</td>
</tr>
<tr>
<td>KM2</td>
<td>4.507</td>
<td>Magazine motor M3 going up relay</td>
</tr>
<tr>
<td>QF1</td>
<td>4.815/4.138</td>
<td>Circuit breaker 4 A</td>
</tr>
<tr>
<td>QM1</td>
<td>4.503</td>
<td>Motor starter protector (2.5 to 4 A)</td>
</tr>
<tr>
<td>QS1</td>
<td>4.242</td>
<td>Main disconnect switch</td>
</tr>
<tr>
<td>R1</td>
<td>4.606</td>
<td>Bar feed alarm relay</td>
</tr>
<tr>
<td>R2</td>
<td>4.606</td>
<td>M-code finish/ Load complete relay</td>
</tr>
<tr>
<td>R3</td>
<td>4.606</td>
<td>End of bar relay</td>
</tr>
<tr>
<td>R4</td>
<td>4.606</td>
<td>Spindle interlock relay</td>
</tr>
<tr>
<td>R5</td>
<td>4.606</td>
<td>Auxiliary end of bar relay</td>
</tr>
<tr>
<td>T1</td>
<td>4.769</td>
<td>Transformer w/ 230VAC output power supply</td>
</tr>
<tr>
<td>T2</td>
<td>4.779</td>
<td>24 VDC Power supply 150W</td>
</tr>
</tbody>
</table>
Upper Guiding Channel Support (double support)
Lower Guiding Channel Support (double support)
Lower Guiding Channel Support (single support)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>02100662</td>
<td>Lower guiding channel support</td>
</tr>
<tr>
<td>320650</td>
<td>Oil supply fitting 320650</td>
</tr>
<tr>
<td>0213154</td>
<td>Oil supply fitting 3213154</td>
</tr>
<tr>
<td>0213064</td>
<td>Oil supply fitting 3213064</td>
</tr>
<tr>
<td>0213063</td>
<td>Oil supply fitting 3213063</td>
</tr>
<tr>
<td>0213062</td>
<td>Oil supply fitting 3213062</td>
</tr>
</tbody>
</table>

Note: Oil supply fitting 3213062 is located directly under alignment pin.
Upper Guiding Channel Support (single support w/ pusher locking tabs)
Upper Guiding Channel Support (single support)
Guiding Channel Locking Mechanism (L/F)
Upper Guiding Channel Locking Paw
Guiding Channel Actuator Shaft (L/F)
Guiding Channel Actuator Shaft (R/F)
Cam Locking Mechanism Drive Motor
Outboard Support Sub-Assembly
Chapter 6: Spare Parts

**Chain Magazine Rack**

[Diagram of Chain Magazine Rack]
Pusher Locking Mechanism Sub-Assembly
Chapter 6: Spare Parts

HYDROBAR SPRINT 555

Belt Drive Sub-Assembly